

Scenario Planning – Managing an Uncertain Future

The Water Authority's water supply reliability assessment can be found in **Section 9**. The Act also requires that, for any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, that the agency describe to the extent practicable, plans to replace that source with alternative sources or water demand management measures.

In order to adequately assess the reliability of the region's future resource mix and plan for potential uncertainties of the water supply sources, the 2010 Plan update incorporates a traditional scenario planning process. The process assesses potential risks associated with implementation of the projected resource mix and identifies management strategies to help deal with the uncertainties. A procedure to track development of supply sources to determine when and if potential adaptive management strategies may be needed is also included.

A list of the primary source documents that were utilized to prepare this section is included in Section 10.3. One of foundational documents used as a resource in selecting the traditional scenario planning process is the 2010 Water Utility Climate Alliance Decision Support Planning Methods: Incorporating Climate Change Uncertainties into Water Planning. (2010 WUCA Report)

10.1 Traditional Scenario Planning Process

There are various decision support planning methods available to planners that incorporate uncertainty and risk assessment into water planning. Traditional scenario planning was selected for the 2010 Plan based primarily on the following factors:

- Used for uncertainty analysis specific to water resources/water utility planning;
- Develops a small but wide ranging set of future scenarios to test and make planning decisions more robust;
- Highly transparent, easily implemented with medium level of development by internal staff, outside expertise not required;
- Does not require extensive computer power, can accommodate changes in assumptions, inputs and objectives;
- Uses concepts familiar to stakeholders, improves understanding and communicability, and avoids the 'black box' issue.

A summary of the basic steps for the 2010 Plan scenario planning process are listed below:

1. Define the focal issue or central question for the process that will be assessed and ultimately answered through the process;
2. Identify the projected water resource supply mix;
3. Identify critical uncertainties that could influence implementation of the mix;

4. Formulate potential scenarios based on the critical uncertainties;
5. Identify common strategies to manage the scenarios; and
6. Establish key tracking metrics that evaluate the status of supply sources in the projected resource mix and whether adaptive management strategies are required to ensure continued reliability.

A Water Authority internal scenario planning team was formed to provide input into the process. The group consisted of representatives from the General Manager's office as well as the Water Resources Department, Conservation Program, Metropolitan Program, and Colorado River Program. They provided expertise to the process, assisting in development of the focal issue (central question) along with identifying the critical uncertainties and management strategies.

Each of the steps taken and the results from the process are described in the remainder of this Section.

10.1.1 Definition of the Focal Issue or Central Question

The focal issue or central question to be assessed and ultimately answered through the scenario planning process is:

In this climate of supply uncertainty and scarcity, how will the Water Authority and its member agencies adaptively provide water supply reliability over the next 20 years?

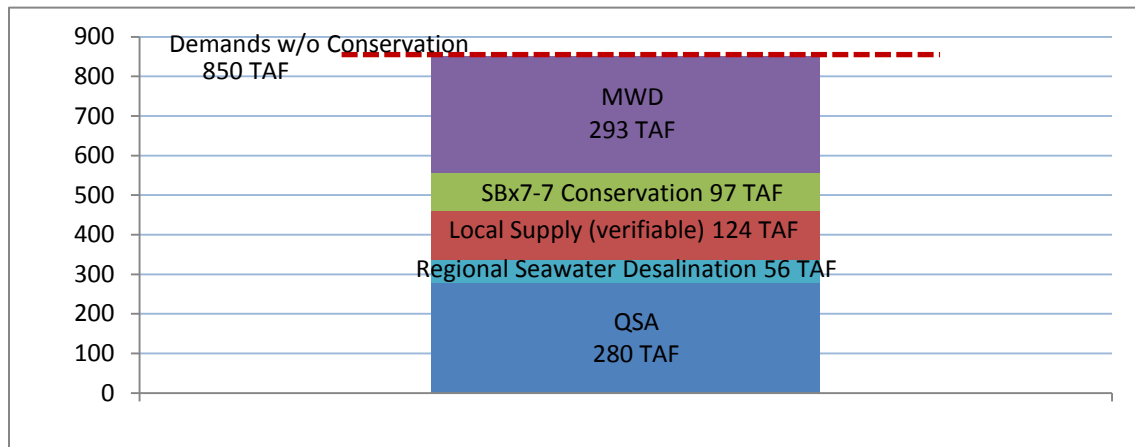
10.1.2 Identify Projected Water Resource Mix

As discussed in Section 9, in coordination with the member agencies, a projected resource mix to meet future demands was generated in five-year increments. For the scenario planning process the projected mix in 2030 was selected for evaluation in order to capture long-term supply planning. The normal weather resource mix in 2030 is based on the following factors:

- Member agency implementation of additional projected verifiable water recycling, and brackish groundwater recovery projects;
- Average yield from surface and groundwater supplies;
- Retail agency compliance with SBX7-7 2020 conservation target of 167 GPCD, which remains the target through 2035;
- Water Authority's QSA supplies delivered in accordance with agreements;
- Deliveries commence from the Regional Carlsbad Seawater Desalination Facility by 2016; and
- Metropolitan is able to meet the supplemental supply needed within the Water Authority's service area.

Figure 10-1 below includes the projected water resource mix for 2030 under normal weather conditions. The scenarios illustrated in the process include SBX7-7 conservation savings to highlight the expected volume and importance of achieving the target in evaluating supply uncertainties.

Figure 10-1
Normal Year (2030)



As shown in Figure 10-1, if the projected Metropolitan, Water Authority, and member agency supplies are developed as planned, no shortages are anticipated within the Water Authority's service area in 2030 in a normal year. Consistent with the UWMP Act, it is important that a risk assessment be conducted on the projected resource mix to ensure long-term reliable and sustainable water supplies to meet demands. This is accomplished through the scenario planning process, with the next step being to identify the critical uncertainties.

10.1.3 Critical Uncertainties Associated with Implementation of Projected Resource Mix

Following identification of the projected resource mix, the next step in the analysis is to identify critical uncertainties surrounding implementation of the mix. Table 10-1 provides a list of the critical uncertainties, derived through input from the internal working group and source documents, such as the Department Water Resources 2009 California Water Plan Update. The list doesn't include all the uncertainties water planners face, but focuses on critical uncertainties associated with supply planning reliability. For example, managing uncertainties associated with physical system reliability, such as a potential pipeline failure, is handled through the Water Authority's Integrated Contingency Plan: Emergency Operations Plan. The critical uncertainties form the basis for developing potential future scenarios. To aid in the process of formulating the potential scenarios, the uncertainties are categorized into whether the source of change is gradual over the long-term or more sudden.

Table 10-1. Critical Uncertainties Associated with Implementation of Projected Resource Mix

Sources of Gradual Change and Uncertainty	Sources of Sudden or Short-term Change and Uncertainty
Demographic	Droughts
Growth deviates from SANDAG Forecast	Severity, timing, and frequency
Climate Change	SWP Regulatory Restrictions
Impacts from long-term changes in temperature and precipitation	Regulatory restrictions are put in place that further limit supply availability
State Water Project Reliability	Delta Levee Failure
Willingness to pay for Delta Fix	Delta levees fail due to earthquake or flooding and supplies are curtailed from SWP
Local Supplies not Developed as Planned	Invalidation of QSA and Related Agreements
Notes: Format adopted from DWR California Water Plan Update 2009, Chapter 5	

10.1.4 Scenario Analysis – Future Potential Scenarios Based on Critical Uncertainties

“Traditional scenario planning, also known as traditional scenario analysis is a methodology that relies on developing future scenarios that consider a variety of potential future situations.” (WUCA, 2010) The scenarios are plausible, but not predictions or forecasts of the future. They incorporate the water supply uncertainties urban water planners face and can be qualitative, quantitative or both. Important to traditional scenario planning is to select just a few scenarios that focus on critical uncertainties and avoid having too many scenarios. When working with numerous scenarios they will begin to blur and lose their meaningful distinctions as decision tools. From the scenario analysis common strategies are developed to manage the uncertainties. The six potential scenarios developed based on the uncertainties are listed in Table 10-2, followed by a detailed description.

Table 10-2. Future Potential Scenarios Based on Critical Uncertainties

Future Potential Scenarios Identified for Planning Purposes	
1	Drought
2	Drought with Further Limitations on Metropolitan Supplies
3	Drought with Limited Metropolitan Supplies and Member Agency Local Supplies
4	Drought with Limited Metropolitan Supplies and Limited Water Authority and Member Agency Local Supplies
5	Demographic Shift
6	Climate Change

The six scenarios and potential supply gap are described below.

Scenario 1: Drought

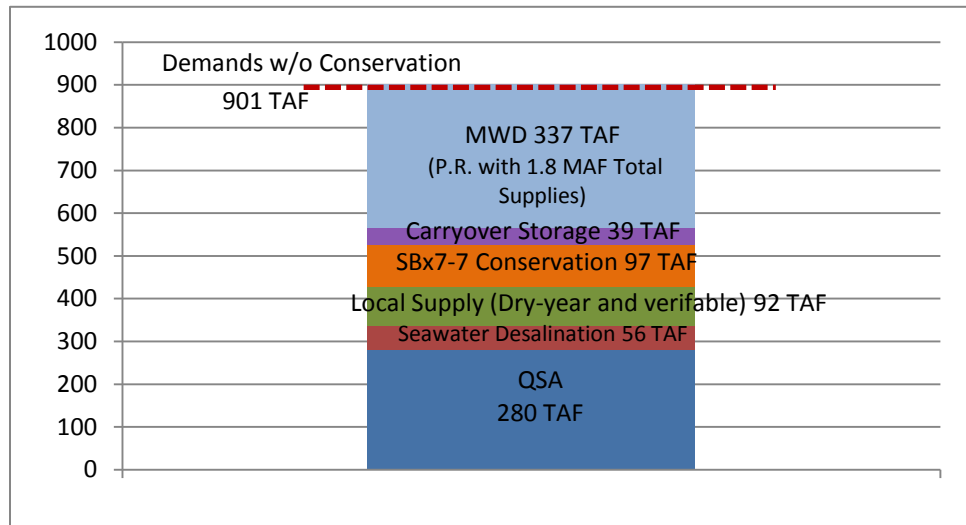
Scenario 1 is a dry-year situation developed based on the following factors:

- Single dry-year demands derived from CWA-MAIN modeling effort (Refer to Section 2);

- Demands do not reflect reductions due to potential mandatory water-use restrictions or public outreach, which might be imposed during drought conditions. These shortage management actions could serve as potential strategies to overcome potential supply gaps. In addition, achieving these demand savings in 2030 could prove more difficult than reductions achieved during the 2007-2010 drought due to demand hardening, as discussed in Section 9.3.1;
- Metropolitan is allocating supplies due to dry conditions. It is unknown how Metropolitan will allocate supplies in the long-term. For this reason and for conservative planning purposes, the Water Authority's allocation is based on its preferential right to purchase supplies from Metropolitan. In 2030 that right is estimated to be approximately 18.7 percent with 1.8 million acre-feet of supply available (Refer to Section 6.1.1 for details on preferential rights);
- Surface and groundwater supply yields reduced based on historic 1990 supplies;
- Supplies utilized from carryover storage reserves;
- Verifiable member agency projected water recycling and brackish groundwater supplies;
- SBX7-7 2020 Conservation target fixed at 167 GPCD beyond 2020;
- Water Authority's QSA supplies are being delivered in accordance with agreements; and
- Deliveries commence from the Regional Carlsbad Seawater Desalination Facility by 2016.

The projected mix of supplies and potential gap are shown in Figure 10-2.

Figure 10-2
Scenario 1 – Drought (2030)



Scenario 2: Drought with Further Limitation on Metropolitan Supplies

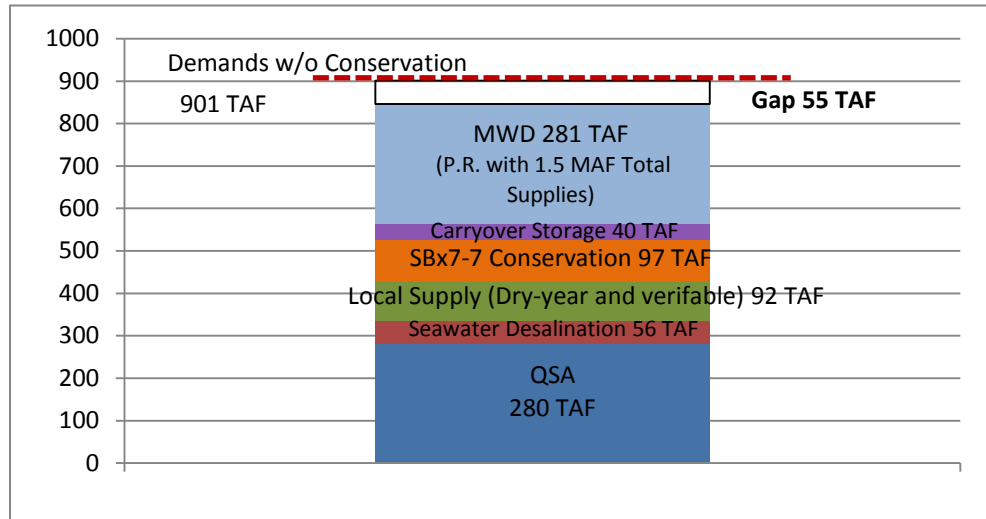
Scenario 2 was developed utilizing the same variables identified in Scenario 1, with the following modification:

- Metropolitan supplies are further limited and being allocated to the member agencies:

- Metropolitan limited to 1.5 MAF of supplies due to dry conditions and increased reductions in deliveries from State Water Project (no delta improvements) and/or reduction in Colorado River deliveries, and
- Water Authority receives estimated preferential right allocation of 18.7 percent.

The projected mix of supplies and potential gap are shown in Figure 10-3.

Figure 10-3
Scenario 2 – Drought with Further Limitations on Metropolitan Supplies (2030)



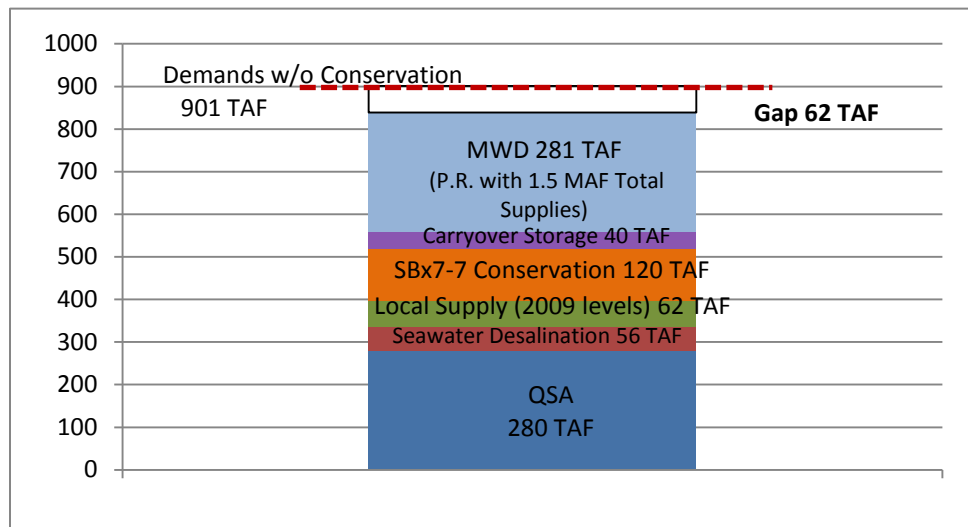
Scenario 3: Drought with Limited Metropolitan and Member Agency Local Supplies

Scenario 3 was developed utilizing the same variables identified in Scenario 2, with the following modification:

- Recycled water and brackish groundwater projects are not developed as planned and remain fixed at current levels; and
- The SBX7-7 conservation target is increased in order to maintain compliance with the 167 GPCD efficiency target. The conservation target must be increased to replace the recycled water yield assumed not to occur. The water use efficiency target identified in Section 2 is shown to be met by both recycled water and conservation.

The projected mix of supplies and potential gap are shown in Figure 10-4.

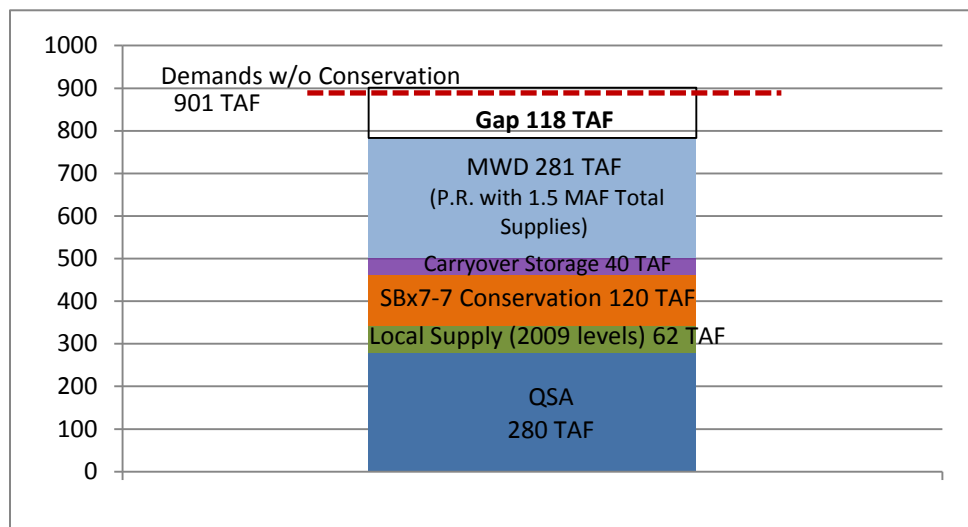
Figure 10-4
Scenario 3 – Drought with Limited Metropolitan and Member Agency Local Supplies (2030)



Scenario 4: Drought with Limited Metropolitan Supplies and Limited Water Authority and Member Agency Local Supplies

Scenario 4 was developed utilizing the same variables identified in Scenario 3, except that the Regional Carlsbad Seawater Desalination Facility is not completed as planned. The projected mix of supplies and potential gap are shown in Figure 10-5.

Figure 10-5
Scenario 4 – Drought with Limited Metropolitan and Limited Water Authority and Member Agency Local Supplies (2030)



Scenario 5: Demographic Shift

As discussed in Section 2, the Water Authority's demand projections are driven by SANDAG's most recent regional growth forecast. In turn, the regional growth forecast is based on the cities and county general plans. Under this scenario, land-use development approval would differ from that identified in the cities and county general plans. Depending upon the variation in housing type, demands could be higher or lower. Single-family homes with larger lots (lower density and potentially more irrigated landscape) will generally use more water than multi-family units (higher density). One potential scenario that would cause demands to be higher than projected is if the multi-family units included in the growth forecast are approved as single-family units. The magnitude of a potential housing shift is difficult to quantify. The affect on water demands due to a shift in demographics would be a gradual change that would be captured in each five-year update to the UWMP. Projected demands in the UWMP updates would be updated based on SANDAG's most recent growth forecast, which would reflect changes to land-use plans occurring between plan updates. In part to deal with this uncertainty associated with land-use approvals occurring during the 2010 Plan planning horizon, an additional demand increment, termed Accelerated Forecasted Growth, has been included in the regional total demand forecast, as discussed in Section 2.

Scenario 6: Climate Change

Scenario 6 considers the potential influence climate change may have on the projected resource mix. Because there are still too many uncertainties regarding the impact of climate change on supplies and demands, a qualitative risk assessment is conducted. The assessment is based primarily on the California Department of Water Resources October 2008 Report entitled "Managing an Uncertain Future; Climate Change Adaptation Strategies for California's Water."

When evaluating the effects of climate change on long-term water supply planning, a distinction should be made between climate and weather. Weather consists of the short-term (minutes to months) changes in the atmosphere. Climate is how the atmosphere "behaves" over relatively long periods of time. The term climate change refers to changes in long-term averages of daily weather. Changes to climate will be gradual, providing water supply agencies the ability to adapt planning strategies to manage for the supply uncertainties. The affect on supply would be gradual and captured in each five-year update to the UWMP.

Researchers have concluded that increasing atmospheric concentrations of greenhouse gases, such as carbon dioxide, are causing the Earth's air temperature to rise. While uncertainties remain regarding the exact timing, magnitude, and regional impacts of the temperature and potential precipitation changes due to climate change, researchers have identified several areas of concern that could influence long-term water supply reliability. These potential areas are listed below:

Loss of Natural Snowpack Storage. Rising temperatures reduce snowpack in the Sierra Nevada because more precipitation falls as rain, and snowmelt occurs sooner. Snowpack in the Sierra Nevada is the primary source of supply for the State Water Project. Snowpack is often considered a large surface "reservoir," where water is slowly released between April and July each year. Much of the state's water infrastructure was designed to capture the slow spring runoff and deliver it during the drier summer and fall months. The California Department of Water Resources projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050.

Sea Level Rise. Rising sea levels could increase the risk of damage to water and water recycling facilities from storms, high-tide events, and erosion of levees. A potential catastrophic levee failure in the Delta could interrupt supplies from the State Water Project, potentially reducing supply

deliveries to the San Diego region from Metropolitan. In addition, rising sea levels could cause saltwater intrusion into the Delta, degrading drinking water quality. More freshwater releases from upstream reservoirs would be required to repel the sea to maintain salinity levels for municipal, industrial, and agricultural uses.

Changes in Average Precipitation and Runoff Volume. The effect of climate change on overall precipitation and runoff volumes is still unclear and highly uncertain. For example, a number of studies conclude that the flow of the Colorado River may be reduced by climate change, but a wide disparity exists on the predicted volume. The yield from local surface water resources could potentially be reduced, if annual runoff volumes are reduced due to a decline in precipitation or there is an increase in evapotranspiration in reservoirs. It must be highlighted that research is still highly unclear on how precipitation levels may be impacted by climate change.

Change in Frequency and Intensity of Droughts. Warming temperatures, combined with potential changes in rainfall and runoff patterns, could exacerbate the frequency and intensity of droughts.

Demands Levels. Climate change could also gradually affect water demands out in the future. Warmer temperatures increase evapotranspiration rates and growing season, which are likely to increase outdoor consumptive water use for landscaping. As part of the water demand forecasting effort for the 2010 Plan, the long-term influence of climate change on demands in the San Diego region was evaluated. Results from the analysis are included in Section 2.

All five of the areas discussed above focus on the potential effect climate change could have on future supply reliability. The potential long-term effect is a possible decrease in the availability of imported supplies from Metropolitan and local supplies – causing a potential gap between supply and demands. With so many unknowns regarding the actual impact, the previous uncertainty scenarios could be seen as capturing any potential shortfalls in supply due to climate change. In addition, the supply and demand impacts from climate change will just start to be experienced within the 2010 Plan 25-year planning horizon, but should be considered in establishing “no regret” strategies that provide water supply benefits within the planning horizon, while increasing the ability to manage potential climate change impacts in the future.

10.1.5 Strategies to Strengthen Implementation of Resource Mix and Manage Uncertainty Scenarios

For each projected scenario, including the projected resource mix, management strategies are identified to both strengthen likelihood of development of identified resources and fill potential gaps in supply. The strategies are generally common to all the scenarios, which mean that such projects and programs will be useful under a wide range of possible outcomes. As a result, they are more likely to be viable as the future unfolds. The strategies include individual elements that can consist of policies and programs, as well as, various potential construction projects.

The management strategies included in the 2010 Plan scenario planning process are derived based on the following:

- Input from internal scenario planning working group, based on evaluation of uncertainty scenarios;
- Water Authority Board 2008 Strategic Plan;

- Water Authority 2015 Business Plan Management Strategies; and
- Previous Water Authority Board actions on policies and programs surrounding supply reliability and development.

Table 10-3 contains strategies that the Water Authority can employ to aid in the implementation of the supplies identified in the projected resource mix and manage uncertainty scenarios. The strategies focus on programs, many of which are already being implemented consistent with Water Authority Board policy.

Table 10-3. Potential Common Strategies to Strengthen Implementation of Projected Resource Mix and Manage Uncertainty Scenarios

Potential Water Authority Policies/Programs
Foundational Strategy
Diversify the region's supply mix, thereby reducing dependence on Metropolitan, and also strengthening the reliability of existing supplies.
State Water Project
Advocate for near-term actions and permanent Delta fixes, including federal and state legislation to fund improvements, which will improve the water quality and supply reliability of the State Water Project.
Colorado River - Quantification Settlement Agreement
Defend the QSA against existing and potential litigation to ensure continued delivery of conserved supplies from canal lining projects and Imperial Irrigation District water transfer.
Member Agency Local Projects
Provide technical assistance to member agencies in the planning, design, and construction of local projects
Continue to provide funding for recycled and brackish groundwater projects through the Local Projects Development Fund
Advocate at local, state, and federal level for minimizing regulatory constraints and enacting acceptable and practicable regulatory standards that allow member agencies to maximize local supply project development.
Advocate for state and federal funding for local projects and work with agencies to ensure projects qualify for funding.
Water Conservation
Offer programs that encourage long-term behavioral change towards measureable reductions in outdoor water use.
Climate Change
Encourage focused scientific research on climate change to identify the impacts on the San Diego region's imported and local water supplies.

In addition to the policies and programs identified in Table 10-3, Table 10-4 provides a list of the potential management strategies that the Water Authority and member agencies can take in regard to managing the uncertainty scenarios and filling the potential gap identified in Figures 10-3, 10-4, and 10-5.

Table 10-4. Potential Strategies to Manage Uncertainty Scenarios (2030)

Potential Strategy	Minimum Estimated Yield (AF)
Member Agency Potential Additional Planned Local Projects¹	
Additional Planned Recycled Water and Brackish Groundwater	14,000
City of San Diego Water Purification Project	15,000
Helix WD/Padre Dam MWD El Monte Valley Recharge Project	5,000
Fallbrook PUD/Camp Pendleton Groundwater Recharge and Recovery Project	5,200
Otay WD Rosarito Beach Desalination Project	32,000
Total Additional Planned Local Projects (Member Agencies):	71,200
Water Authority Potential Strategies	
Potential Regional Seawater Desalination Facility (Camp Pendleton):	56,000 - 168,000
Regional Shortage Management Actions (Dry-year transfers and potential extraordinary conservation savings)	-- ²
Total Minimum Estimated Yield from Potential Strategies:	127,200 – 239,200

¹ The estimated yields from the additional planned local supply projects are from the member agencies and the development and implementation of these supplies rests with the member agencies.

² Availability of dry-year supplies is described in Section 11.2.3.

If the uncertainty scenarios were to materialize, the potential gap, based on current information and variables could potentially range from approximately 55 TAF to a maximum estimate of 118 TAF. As shown in Table 10-4, there are currently strategies (alternative supply sources) that could potentially be implemented that would assist in ensuring supply reliability if imported supplies are limited or verifiable local supplies are not developed as planned.

In regard to Scenario 6: Climate Change, the strategies outlined in Tables 10-3 and 10-4 can also be utilized to manage the supply uncertainties associated with a changing climate. For example, the foundational strategy to diversify the region's resource mix through development of local projects, such as recycled water and seawater desalination, reduces reliance on imported and local surface supplies, whose yields could potentially decrease as a result of climate change. The strategies identified in this section provide supply reliability benefits within the planning horizon, while increasing the ability to manage potential climate change impacts in the future.

There are a number of factors that influence the decision to develop a new supply project, such as reliability, political will, community support, cost and financing. A key factor often considered when evaluating potential supply strategies is the project costs. In September 2010, the Water Authority prepared a report evaluating the comparative cost of the next increment of supply, using specific project studies. To ensure equitable comparison, the evaluation excludes avoided costs and external incentive and grants. The estimated cost of the next increment of local supply based on actual proposed San Diego region project units costs for the following local supplies are: brackish groundwater (\$1,700/AF – \$2,100AF/YR), indirect potable reuse (\$2,200/AF - \$2,300/AF), and seawater desalination (\$1,600/AF - \$2,300/AF). Through the 2012 Master Plan update these costs will be further evaluated and refined.

As listed in Table 10-4, extraordinary conservation is identified as a potential shortage management action to assist in managing uncertainties. It should be noted that, due to SBX7-7 retail compliance, the amount of extraordinary savings expected to be achieved through mandatory measures, such as water-use restrictions, could be less than that experienced in the current and previous shortage periods. This is due to the concept known as demand hardening, which is described in the dry-year reliability assessment (Section 9.3).

10.1.6 Key Tracking Metrics – Track Progress on Implementation of Projected Resource Mix and Need for Adaptive Strategies

Through the scenario analysis, the projected resource mix plus the six uncertainty scenarios have been identified. Potential strategies to strengthen implementation of the resource mix and manage the uncertainty scenarios have been identified. The critical final step, which links these two components, is to establish a few key tracking metrics that evaluate the status of supply sources in the projected resource mix and whether the adaptive management strategies are required to ensure continued reliability. The primary vehicle for reporting to the Board on the metrics would be through the Water Authority's Annual Water Supply Report. Water Authority Administrative Code Section 8.00.050 outlines preparation of an annual water supply report that would provide information on the reliability of existing supplies and implementation of plans and programs to meet the future water supply requirements. The annual report serves as an excellent vehicle to monitor the key tracking metrics. A complete evaluation and update of the resource mix would occur every five years with update of the UWMP. Table 10-5 highlights the timing upon which the Water Authority Board would track progress on implementation of the projected resource mix and evaluate the tracking metrics. If necessary, reporting to the Board on issues related to implementation of the resource mix could occur more frequently.

Table 10-5. Tracking Progress on Implementation of Resource Mix

Time Period	Vehicle	Purpose
Annually (except UWMP years)	Annual Supply Report to Board (Consistent with Administrative Code Section 8.00.050)	Utilizing key indicators, conduct evaluation and track progress on implementation of UWMP projected water resource mix
At Least Every 5 years	Urban Water Management Plan Update	Conduct evaluation of supply and demand conditions and update projected resource mix
As Needed	Reports to Board	Update the Board on issues impacting resource mix implementation

With the many unknown factors and outside influences affecting development of supply sources in the projected mix, the key metrics for tracking implementation will be included in the next update of the annual supply report, planned for completion in 2012. The metrics could be reset with each annual supply report update. Table 10-6 lists the key tracking metrics to be considered in the 2012 Annual Water Supply Report for the region's two sources of imported supplies. Table 10-7 lists the key tracking metrics for 2012 Annual Water Supply Report associated with water conservation and local supply development. The metrics in both tables were derived based on supplies identified in the projected resource mix and the Water Authority 2008 Strategic Plan Objectives and 2015

Business Plan Goals. For further information on the action or event listed in Table 10-6, please reference Sections 4 and 6 on Water Authority and Metropolitan supplies.

Table 10-6. Proposed Key Tracking Metrics for 2012 Annual Water Supply Report Major Sources of Imported Supplies

Management Action or Event - Description	Key Metrics for 2012
State Water Project – Bay-Delta Improvements	
The BDCP is to provide the regulatory approvals and framework for achieving the co-equal goals of supply reliability and ecosystem restoration. Scheduled for completion by end of 2012.	Has the draft BDCP and EIR/EIS been released for public review? Are documents still on schedule for approval by the end of 2012?
The state water bond measure (Safe, Clean and Reliable Drinking Water Supply Act) will, in part, provide funding to carry-out the BDCP and is scheduled for November 2012 ballot.	Has the water bond measure passed?
Near-term Delta actions are being pursued by Metropolitan to provide increased supply reliability prior to a long-term Delta fix. (i.e., the Two-Gate System and habitat restoration projects.)	Has progress been made towards completion of the near-term projects that would increase SWP supply reliability?
Colorado River Aqueduct	
The Bureau of Reclamation has claimed that under certain hydrologic conditions, a potential shortage declaration could be made on the Colorado River which could impact yield from Metropolitan's WSDM programs on the Colorado River.	Have dry-year conditions resumed within the Colorado River watershed? Has the Secretary of the Interior declared shortages?
Superior Court judge invalidated 13 agreements related to the Quantification Settlement Agreement. The Water Authority and other parties involved in the QSA have appealed the judge's decision. Appellate decision is expected in 2011 or 2012.	What is the result of the appellate court? Will there be reductions in QSA supplies to Metropolitan and Water Authority?

Table 10-7. Proposed Key Tracking Metrics for 2012 Annual Water Supply Report Water Conservation and Local Supply Development

Management Action or Event - Description	Key Indicators for 2012
Water Conservation	Is per capita water use on track to achieve retail 2020 SBX7-7 target?
Water Recycling	Is recycled water development on track to assist in achieving the 2020 SBX7-7 target included in UWMP?
Brackish Groundwater	Is brackish groundwater development on track to achieve the UWMP targets?
Seawater Desalination	Is the Carlsbad seawater desalination facility on track to be on-line by 2016?

The analysis included in the annual supply report will include a discussion on the status of the proposed metrics identified in the table above and overall implementation of the projected resources mix. Highlighting this list of metrics, doesn't preclude other metrics from being evaluated in the supply report. Key to the reporting will also be an update on the potential strategies; whether they remain a viable option taking into account specific project studies and political decisions made over the reporting period.

10.2 Conclusion

As identified at the beginning of the scenario planning process, the focal question that ultimately needed to be answered as a result of this process is:

In this climate of supply uncertainty and scarcity, how will the Water Authority and its member agencies adaptively provide water supply reliability over the next 20 years?

Based on the results of the scenario planning process, the Water Authority and its member agencies can help ensure a long-term reliable water supply for the region through the following four basic measures:

1. Implementation of the diverse resource mix identified in the 2010 Plan;
2. Retail compliance with the SBX7-7 conservation compliance target;
3. Continue to implement programs and explore additional planned local projects that could strengthen implementation of the projected resource mix and manage potential shortfalls in development of supplies identified in the resource mix; and
4. Conduct annual tracking and reporting on implementation of the mix that will allow for the Water Authority and its member agencies to take appropriate action if supplies in the resource mix are not developed as planned.

While these measures focus on supply development, the Water Authority and its member agencies will also be conducting a Regional Water Facilities Optimization and Master Plan Update in 2012. As discussed in Section 1.5, the 2012 Master Plan Update will, among other objectives, match new infrastructure needs with the water demand and supply projections included in the 2010 Plan. This is another important element to ensuring a long-term reliable supply for the region.

10.3 Primary Source Documents

California Department of Water Resources. California Water Plan Update 2009. Chapter 5: Managing an Uncertain Future.

California Department of Water Resources, 2008. Managing an Uncertain Future; Climate Change Adaptation strategies for California's Water.

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Howe, Charles W., Goemans, Christopher, 2007. "The Simple Analytics of Demand Hardening." Journal AWWA.

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Schartz, Peter, 1991. The Art of the Long View: Planning for the Future in an Uncertain World.

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